

Diagnostic development for Heavy Ion Fusion * F.M. BIENIOSEK, C.C. DUGAN, W.B. GHIORSO, J.W.KWAN, L. PROST, Lawrence Berkeley Laboratory and the Heavy Ion Fusion Virtual National Laboratory (HIF-VNL), A.W. MOLVIK, Lawrence Livermore National Laboratory and the HIF-VNL.

We discuss progress in diagnostic development for the Heavy Ion Fusion program in the HIF-VNL at LBNL and LLNL. Typical HIF beams are high current (up to 1 A), and the energy range is 0.5 to 2.0 MeV, increasing to 10-100 MeV in the near future. Beam parameters of interest include current, density distribution, energy, energy distribution, emittance, and space potential, in injector, transport, and final focus sections. Some diagnostics now under development include:

Optical diagnostics based on fluorescence imaging of the beam on a scintillator screen; a multiple-channel slit scanner to replace the single slit-cup arrangement now in use for emittance measurements; diagnostics to characterize secondary electrons and production of secondary particles at the wall, including an instrumented target to measure gas evolution and secondary electron production, and gridded ion energy analyzer to measure energy of background ions expelled from the beam; and a kapton-based pepper pot for beam phase-space characterizations.

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